

What is claimed is:

1. A semiconductor device comprising:

an emitter layer;

5 a base layer; and

a collector layer, the sum of a band gap and electron affinity of said emitter layer being larger than the sum of a band gap and electron affinity of said base layer, wherein said base layer contains Bi.

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2. The semiconductor device according to claim 1, wherein said base layer contains GaAsBi.

3. The semiconductor device according to claim 1, wherein

15 said base layer contains GaAsBiN.

4. The semiconductor device according to claim 1, wherein said base layer contains InPBi.

20 5. The semiconductor device according to claim 1, wherein the amount of Bi contained in said base layer increases from the emitter side toward the collector side.

25 6. The semiconductor device according to claim 1, wherein said emitter layer includes at least one selected from the group consisting of GaAs, AlGaAs, InGaP, and InP.

30 7. The semiconductor device according to claim 1, wherein said collector layer includes at least one selected from the group consisting of GaAs, InGaAs, and InP.